

ATHENS WORKSHOP

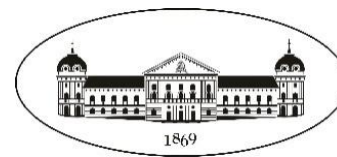


Workshop Joint FIG Commissions 3 and 8
Athens – 13th and 14th December 2022



Using geoinformation and VGI in formal education

**Bashkim IDRIZI, Lyubka PASHOVA,
Neriman SELIMI, Driton IMERI**



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Introduction

- **Pupils need knowledge** of natural, social, and technical areas, while **society expects that certain aspects** of knowledge areas would be taught to pupils!
- **The globalization trends** make easier following latest technology and methodologies by teachers in order to use them for teaching pupils.
- **Spatial thinking** allows students to comprehend and analyse phenomena related to the places and spaces around them—and at scales from what they can touch.
- **GIS tools can help pupils** taking better notes, improve comprehension and foster creativity.
- **Pupils are privileged by being familiarized with using electronic devices**, and they can very easily convey the acquired skills from usage of computers, tablets, smart phones etc. to an effective map compilation, that **can be implemented with well trained staff in education institutions!**
- Systematic usage of FOSS, OD and online applications in educational institutions.

8 (eight) reasons why GIS technology can enrich the educational process in school

- The learning materials will be easier to perceive, and learning much more fun;
- The functional literacy of students will be developed;
- Team working in and outside the classroom will be stimulated;
- Pupils will be dived into different cases and a variety of scenarios;
- Spatial and critical thinking of pupils will be developed;
- Students' skills to ask the right questions and seek solutions to local and even global problems will be improved;
- The world trends for multidisciplinary education will be applied; and
- By using constantly developing modern technologies, students will get an opportunity for working in a maximum modern learning environment.



Current conditions with using GIS in primary and secondary school curricula

- GIS in primary and secondary schools is missing!
 - Cartography is present as a part of geography subject.
 - Programs are limited only on usage of paper maps aimed for learning geospatial phenomena, without information for map making process and using digital geoinformation.
- Although most of schools has computer rooms, geography teachers don't use them for using GIS software for map making and performing spatial analyses with pupils.
- It needs to be analysed
 - why younger teachers that have been degreed in geography after year 2000 don't use GIS software in teaching process,
 - why responsible institutions didn't provide trainings for using GIS software to older teachers in systematic and organized process as lifelong learning programme, and
 - the reason of not including GIS and other GeoICT tools in geography curricula's within the education process as obligatory practical exercises

Training for map making and VGI with GIS software

- Training objectives
- Developed curricula
- Conducting training in period
- Cartographic products from performed training
- Updating OSM database by pupils

Training objectives

- Pupils have to understand map as model;
- Pupils have to understand and use the map legend;
- Pupils have to identify and explain natural and social features shown in map;
- Pupils have to be familiar with map orientation and using map for orientation and movement in a field;
- Pupils have to be familiar with vector and raster data formats in digital cartography and GIS;
- Pupils have to use GIS tools of FOSS for map making and performing spatial analyses;
- Pupils have to know downloading spatial data from open portals, and have to be familiar with the copyrights on open data;
- Sharing awareness importance of opportunities on contribution as VGI (Voluntary Geographic Information) by online editing and updating spatial data in open geoportals; and
- Pupils have to be familiar with usage of GIS applications in computer, tablets and smart phones for learning other subjects.

Designed curricula

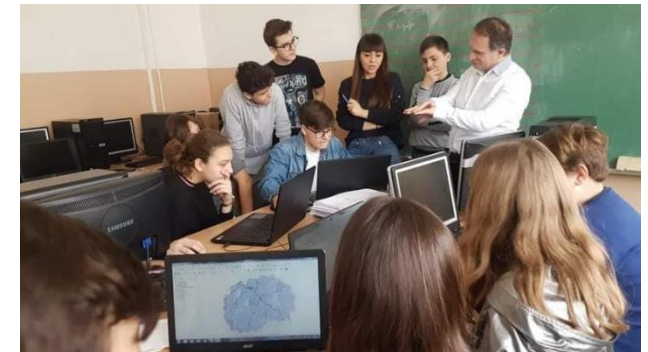
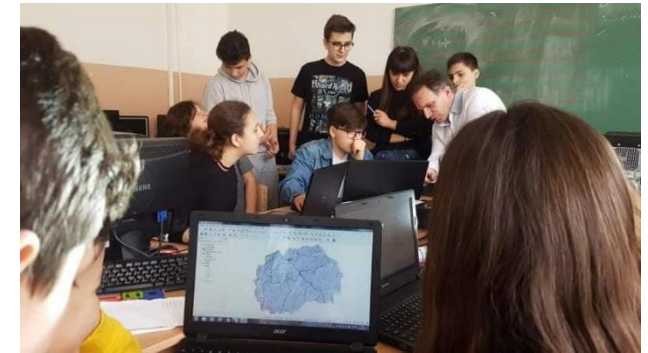
- Introduction on maps and map contents
- Introduction on GIS and map making tools
- Introduction on FOSS and OD with practical lessons for downloading and usage
- Field identification and data acquisition with smart phone applications
- Data editing in GIS software
- Map compilation process and printing
- Orientation and movement in a field with paper map and mobile maps by smart phones
- Contributing to open geodatabases as VGI
- Introduction to basics of crowd sourcing and geoportals / Spatial Data Infrastructures (SDI)

Case study 1: Pilot project for education of pupils on map making and VGI by using GIS tools and OSM

- Initiative by the Geo-SEE Institute from Skopje
- Beneficiary: Primary school “Ismail Qemali” from Skopje
 - Memorandum of understanding
- Training type: training the trainers
 - Trained pupils to be able transfer knowledge to other pupils, together with teachers.
- Participants: 1 IT and 2 geography teachers, and 16 pupils from 6-9 level.

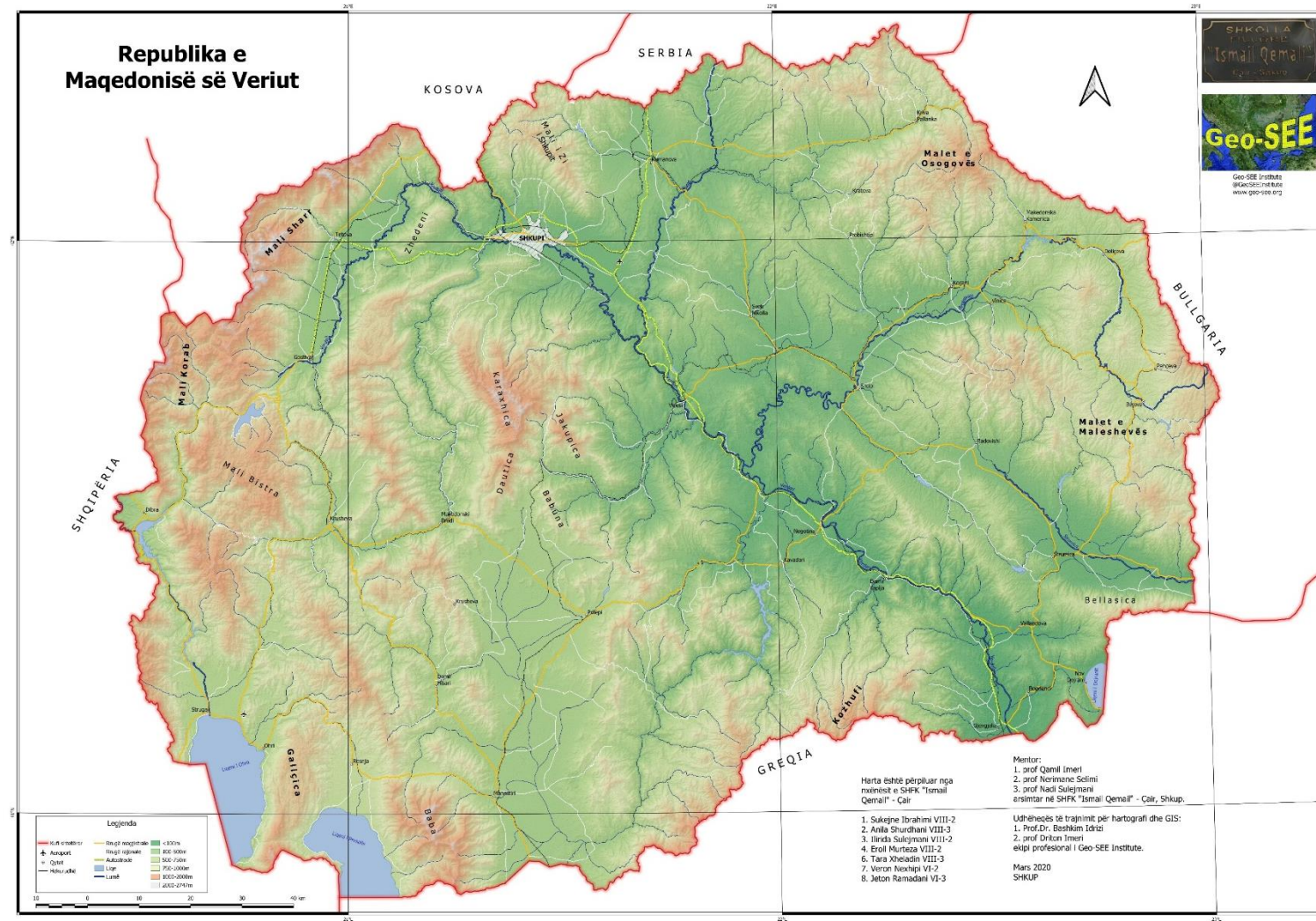
Conducting training

- Software: QGIS www.qgis.org
- Source data:
 - Open street map www.openstreetmap.org
 - SRTM <https://www2.jpl.nasa.gov/srtm>
 - Global Map <https://globalmaps.github.io>
- Main tasks:
 - Usage of QGIS software
 - Downloading and editing spatial data
 - Data acquisition with field identification
 - Map compilation and
 - Updating open database of open street map.



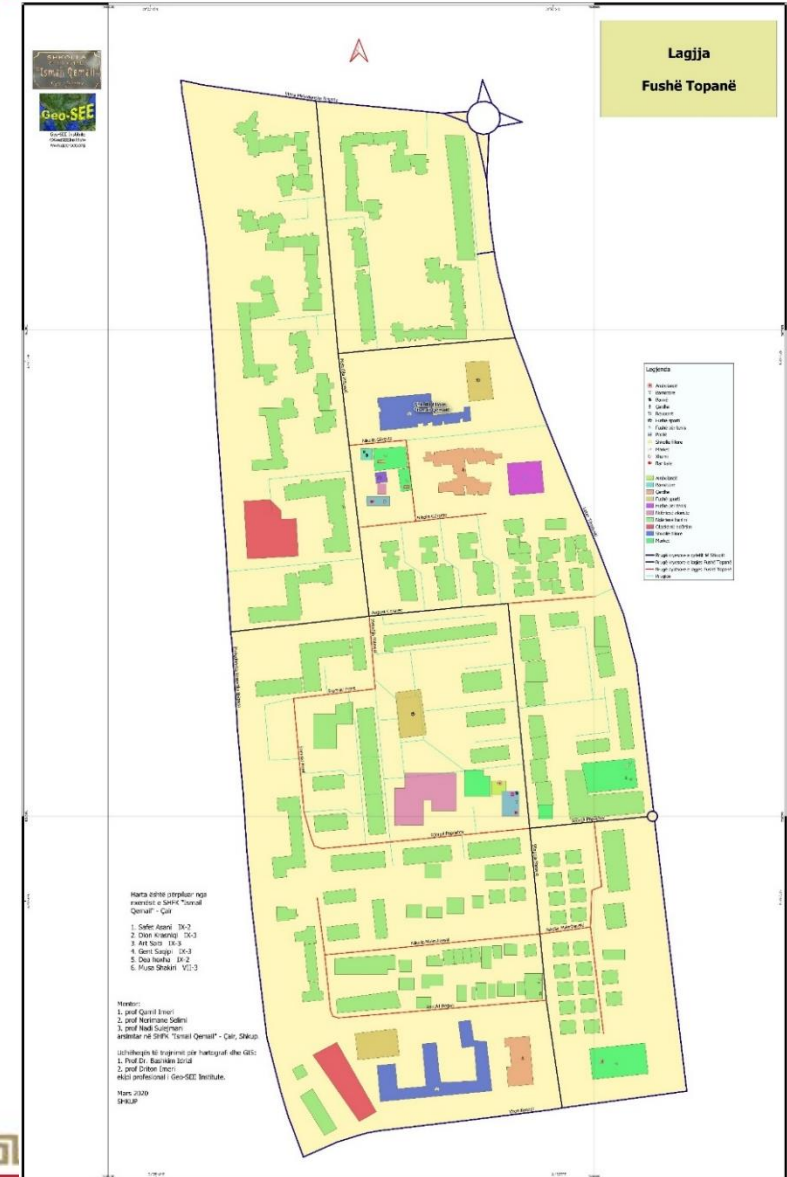
Cartographic products from performed training (1)

- Map of North Macedonia
- *by the first group of pupils from 6th and 7th level, and*



Cartographic products from performed training (2)

- Map of neighbourhood “Topansko Pole (Fushë Topanë)” as city map
 - *by the second group of pupils from 8th and 9th level.*



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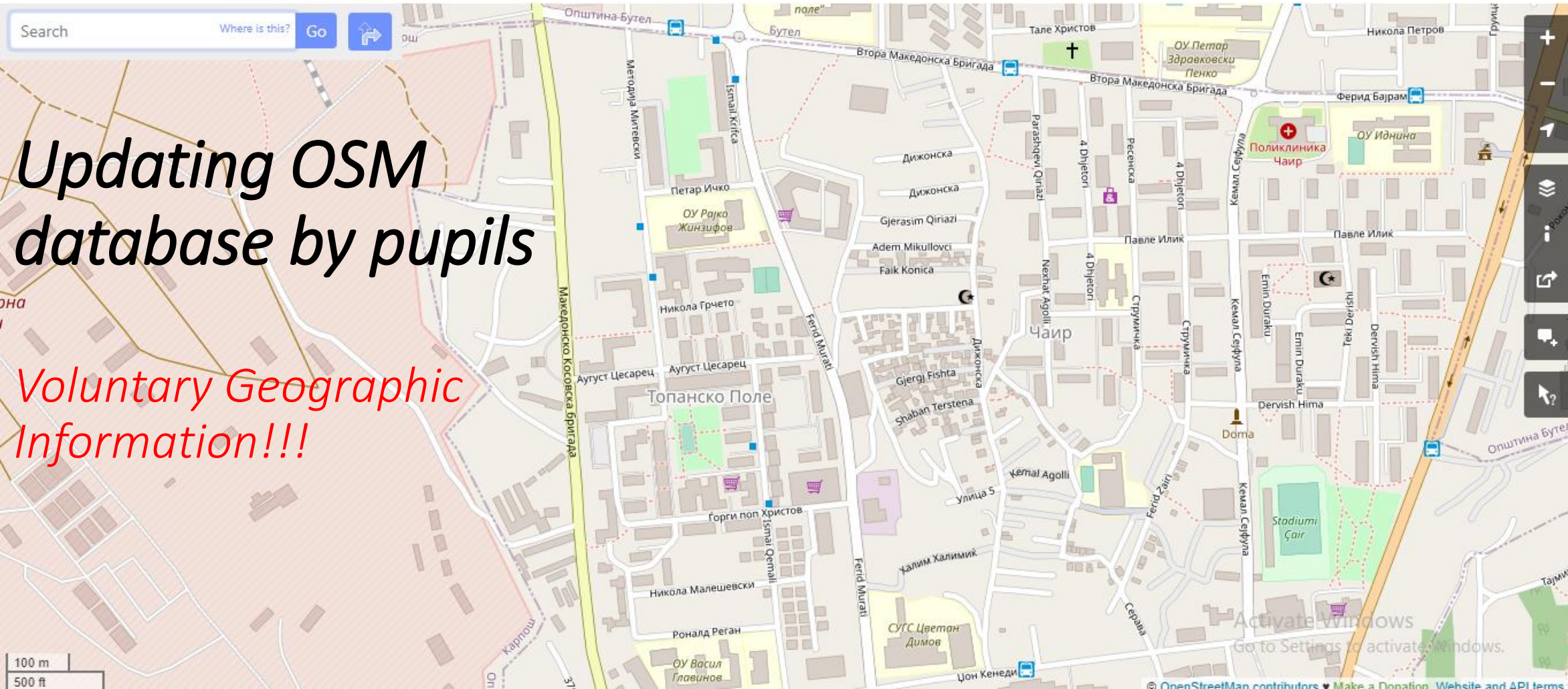
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openstreetmap.org/#map=16/42.0179/21.4350

OpenStreetMap Edit History Export

GPS Traces User Diaries Copyright Help About Bashkim IDRIZI



*Updating OSM
database by pupils*

*Voluntary Geographic
Information!!!*

100 m
500 ft

Presentation and dissemination of training results

- March 7th, during the celebration of Albanian teachers' day,
- Dissemination through Geo-SEE Institute and school Ismail Qemali.



Case study 2: Pilot project for education of pupils on using QGIS and OSM

- Project “Academy “My Green City”
- Contractor – NIGGG – BAS, Leader: Assoc. prof. M. Varbanov;
[Академия "Моят зелен град" » Програма "Образование с наука" \(educationwithscience.online\)](http://educationwithscience.online)
- Beneficiary:
 - ✓ National Science and Mathematics High School "Acad. L. Chakalov“, Sofia
 - ✓ Mathematical High School "Paisiy Hilendarski“, Sofia
 - ✓ Primary School "Khan Krum", Sofia
- Main goal: the study of the state of the environment in large urban areas and the negative anthropogenic impact on their inhabitants using QGIS and open data
- Training type: training the trainers and students
 - Trained pupils to be able transfer knowledge to other pupils, together with teachers.
- Participants: Teachers – 4
- Students (8th-10th grade)

Project implementation: MODULE 4

- Software: QGIS www.qgis.org
- Source data:
 - Open street map www.openstreetmap.org
 - Global Map <https://globalmaps.github.io>
 - Other free accessible environmental data
- Main tasks:
 - Using QGIS software to create a map of a local area (near the school) of Sofia
 - Downloading and editing spatial data
 - Data acquisition with field identification
 - Map compilation

Using QGIS for a thematic map creation

MODULES	DESCRIPTION	RESULTS
MODULE 4.1	Basic concepts of working with GIS	Students / teachers to gain general knowledge and understand the possibilities provided by the use of GIS
MODULE 4.2	Creating a map in a QGIS Environment	Students / teachers to become familiar with the methods and techniques of creating thematic maps in a QGIS environment, to acquire skills to work with a geographic database
MODULE 4.3	Creation of thematic maps for assessing the state of the environment in Sofia	Students / teachers to acquire skills to create thematic maps with data on water, state of water and biodiversity for the city of Sofia in a QGIS environment, to edit and print them

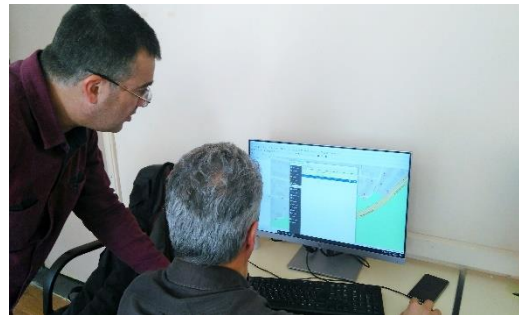
Training teachers and students to use QGIS



Launching the QGIS open source GIS course.



Creating a thematic map using the QGIS tools



Training of teachers and students on how to use QGIS for map creation

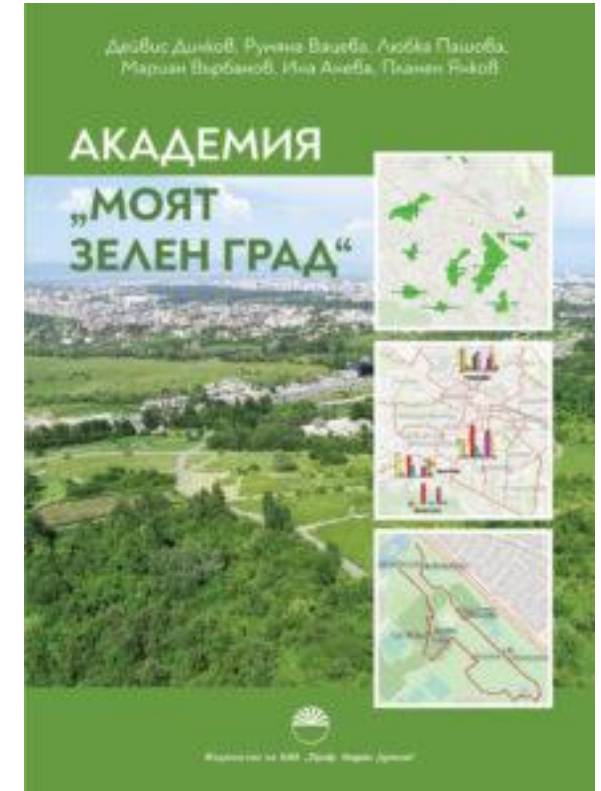


Published educational book for primary schools

https://educationwithscience.online/wp-content/uploads/2019/11/Akademia_Moi-zelen-grad_e-book_-Cover.pdf

MONOGRAPH “ACADEMY ”MY GREEN CITY“

- summarize the main results of the implementation of the scientific-educational project "Academy "My Green City" of NIGGG.
- support the educational process in natural science classes of secondary schools in the country
- acquaint readers with scientific methods and approaches for working with data and information about the environment
- Provide guiding steps to make a thematic map
- 3 examples of creating thematic maps are given



Case study 3: Pilot project for education of pupils on using QGIS and OSM

- Ongoing project
- Secondary school “Kuvendi i Lezhes”
- Age: 14 – 15-year-old
- Target: IT and geography teachers and students
- City: Viti
- Country: Kosovo
- Period: November 2022 – March 2023



Geo-SEE Institute is certified organization for providing official certificates in North Macedonia

QGIS - Training Course by Geo-SEE Institute

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Accreditation

Accredited from the Ministry of Education of Sciences and Center for Adult Education of the Republic of North Macedonia

References:

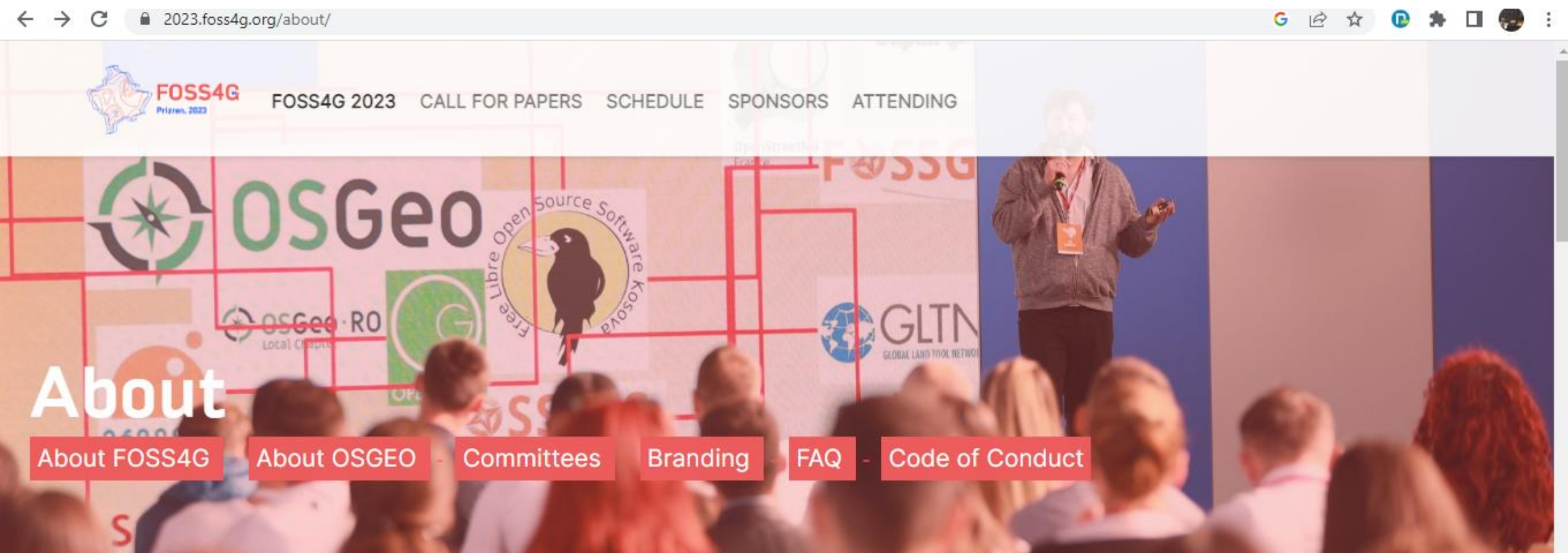
<http://cov.gov.mk/members/geo-institut/>
<http://cov.gov.mk/course/стручна-обука-по-qgis-ниво-1>
<http://cov.gov.mk/course/стручна-обука-по-qgis-ниво-2>

Ongoing efforts for QGIS

- QGIS USER ALBANIA
- QGIS USER GROUP KOSOVA
- QGIS USER GROUP NORTH MACEDONIA



June 26 – July 2, 2023, Prizren, Kosovo



The screenshot shows the website for FOSS4G 2023. The browser address bar displays "2023.foss4g.org/about/". The website header includes the FOSS4G logo and navigation links: "FOSS4G 2023", "CALL FOR PAPERS", "SCHEDULE", "SPONSORS", and "ATTENDING". The main content area features a large image of a speaker on stage with an audience in the foreground. The background of the image contains logos for OSGeo, OSGeo-RO, Free Libre Open Source Software Kosovo, and GLTN. A navigation menu at the bottom of the page lists: "About FOSS4G", "About OSGEO", "Committees", "Branding", "FAQ", and "Code of Conduct".

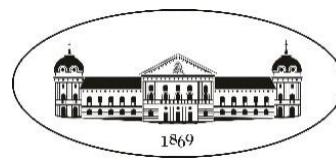
Conclusions

- Pupils were happy by using GIS tools;
- Pupils were interested to learn and to use new technology as tool for spatial data understanding;
- Geospatial technology should be implemented in curriculums for primary schools' study programs;
- Using electronic devices as smart phones and tablets in practical part of lectures for learning the spatial phenomena, could motivate pupils exploring;
- Such system can enrich the educational process aimed to improve skills of pupils for critical thinking and multidisciplinary analyses.



Thank you for your attention!

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